SPECIFICATION

TITLE OF THE INVENTION : " **TRIPLE CLEAN TOOTHBRUSH** "

Cross References : Provisional Patent #60/210238 dated 06/08/00 and
Provisional Patent #60/237078 dated 09/30/00 .

BACKGROUND OF THE INVENTION

This invention relates to a toothbrush that also comprises two other dental hygiene accessories such as a small interdental hardbrush and a rubber cone shaped periodontal gum massager and stimulator, ready for use as part of the same artifact.

In the field of dental hygiene, the dentists have available a multiplicity of tools and brushes that they use for cleaning the teeth, massaging the gums and preventing periodontal diseases. The dentists recommend that in addition to brush cleaning the teeth with a conventional toothbrush, every person should as frequently as possible, individually, massage and stimulate the gums to firm the gum tissue and prevent periodontal disease. To achieve this effect, a rubber pointed cone shaped massager and stimulator tip, small enough for insertion into and between two teeth, at the gum line, should be used. On insertion between the teeth, the user applies light pressure to the rubber tip so that, besides acting like a toothpick, dislodging from the little spaces any possible minuscule particle, with a circular motion, it will also massage and stimulate the gums. Until now, the said rubber tip has been generally attached at right angles to the end of a special tool, to a separate small diameter bent tubular tool, or molded firmly on and projecting from the end of a toothbrush.

Dentists recommend also to brush the curved faces of the teeth where they interface with the gums, and so a small compact interdental hard brush should be used to fit in the pocket space formed by the gum and two adjacent teeth. By moving this small hard brush in and out, and side to side, it cleans the portions of the teeth generally not reached by a conventional toothbrush.

In fact, these unrelated operations require, besides the conventional toothbrush, two different tools to efficiently accomplish the perfect tooth brushing and lateral cleaning, as well as gum massage functions. All the three tools, if separate, are difficult to handle, package, carry around and are independently vulnerable to loss, damage, contamination, never seem to be available when needed, and are very inconvenient for separate storage and accessability.

All of the heretofor known toothbrushes that contain a rubber gum massager and stimulator tip attached to the end of the handle suffer from a number of disadvantages:

(a) when said gum massager and stimulator tip is positioned on the end of the handle, it projects outwardly normal to the flat face of the handle, and when the toothbrush user grabs the handle, the rubber point bent over and can become damaged;

(b) the said gum massager and stimulator tip on the end of the handle can become contaminated by the hand of the user when he (or she) handles the toothbrush and his (or her) hand overlaps the projecting rubber point;

(c) the said gum massage stimulator tip molded onto the handle cannot be removed or replaced if needed, should the rubber point becomes broken or worn by the hands of the user;

(d) when, after brushing, the said toothbrush ending projecting gum massager and stimulator tip is put away and is not thoroughly covered or wrapped, it can become disclored, dirty or contaminated from exposure to the surrounding where it was retained in. This contamination, then, is transferred to the gums by the user.

To accommodate the many dental requirements for tools to meet diverse dental situations, prior art has developed a series of systems and arrangements that add and exchange dental tool heads to a variety of handles. This exchange operation requires the user to store, provide access to, and spend time applying and removing the various components during his (or her) toothbrush operation. Such loose components can easily be misplaced, lost, contaminated or just not used because they are not readily available in the time needed to perform at least twice daily the complete tooth and gum hygiene requirement.

For example, U.S. Patent No. 5,058,230, Milton Hodosh et all, presents a cheap handle with a removable head. There is little or no need to have loose components that must be stored, protected, found and applied for each toothbrush operation on a regular basis. Every component must be readily available or it will not be used . Likewise, Patent No.5,511,276 Kuo-Ming Lee, presents a removable brush head and a latching assembly to lock to the handle. Again, the brush head is a loose component that latches in and out of the handle.

Patent No. 5,934,295 Vladamir Gekhter et al, also presents a patent that contains a handle with a multiplicity of removable brushes and tool components that require storage and must be made available for ready use by the toothbrush user. This configuration provides the dentist with considerable options when addressing tooth problems in a dentist office, but is not the type of tool that encourages ready, constant, scheduled, dedicated everyday individual user to spend needed time and deligence on his (or her) dental hygiene requirements. To encourage good dental practices, the required tools must be on hand, ready for immediate use, and not inside a box or in a drawer, forgotten or overlooked.

The uniqueness of the present ready to use triple-clean effect toothbrush does not infringe on either of the above referred to Patents.

BRIEF SUMMARY OF THE INVENTION

This invention provides a means for combining the brushing cleaning function with the gum massage function and the much needed interdental brush function, all in one tool. In order to achieve the triple clean effect of this toothbrush, the body of the tool contains at one end the brush with the bristles clustered in groups to provide an efficient pattern to fully brush the teeth externally, in a conventional manner. These bristles are captured in the end of the toothbrush body, in an elongated pattern, and are firmly molded into the material. In this invention, the toothbrush body contains a means for providing a gum massage stimulator tip and a small interdental hard brush in the same toothbrush body, for ready use by the user. This is achieved by internal hollow spaces in the toothbrush body that form the handle, and a portion of the toothbrush body that holds the bristles. This unique arrangement holds together all three components of a triple-clean tool, thus providing tooth brushing, interdental clean-and-brush functions, as well as gum massaging, all in one handy toothbrush.

Presently, and because it has been found that a separate tool for each function has caused inconvenience for storage and availabililty, there are several objects and advantages of this invention when creating a single triple-clean toothbrush:

(a) the three necessary teeth and gum brushing, cleaning and massaging functions are combined in one single tool;

(b) the three tools are readily available to the user;

(c) the three tools are positioned in such way that each of them will not be mishandled and contaminated by the user while he (she) is using any of the other two tools;

(d) the interdental hard brush and the gum massager and stimulator tip are protected from damage by being incased in the toothbrush;

(e) there is a need to have all three functions readily available when people are brushing their teeth and, at the same time, taking care of the gums, following every dentist's instructions for perfect oral hygiene.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

Figure 1 shows the toothbrush in plan view with the interdental hard brush and gum massager and stimulator tip installed in tandem in the handle and retracted.

Figure 2 shows the toothbrush in side view with the interdental hard brush and gum massager and stimulator tip retracted and two buttons that extend these tools.

Figure 3 shows the toothbrush in sectional view with the interdental hard brush extended from one end, and the gum massager and stimulator tip extended from the opposite end.

Figure 3A shows an enlarged view of the engagement of the interdental hard brush and the gum massager and stimulator tip, with the internal extension tube.

Figure 4 shows the toothbrush in sectional view with the interdental hard brush and gum massager and stimulator tip retracted.

Figure 5 shows the toothbrush with the interdental hard brush and gum massager and stimulator tip installed inside the hollow chamber of the parallel cylinders in the handle, and retracted.

Figure 6 shows a cross section through the two hollow cylinders that comprise the handle.

Figure 7 shows the toothbrush with the interdental hard brush and gum massager and stimulator tip extended from the parallel hollow cylinders.

Figure 8 shows the side view of the toothbrush with the gum massage stimulator tip and interdental hard brush retracted.

Figure 9 shows a side view and a cross section of one of the parallel hollow cylinders with an extension tube that extends and retracts the interdental hard brush with a traveling slider.

Figure 10 shows an esternal side view of the complete toothbrush.

Figure 10A shows a cross section of the toothbrush with the button that moves the gum massager and stimulator tip in and out of the hollow space of one of the cylinders.

Figure 11 shows the toothbrush with the interdental hard brush and gum massager and stimulator tip installed inside two parallel recesses chambers of the handle, and sliding covers that protect each of the two tools.

Figure 12 shows the toothbrush with the sliding covers open and the interdental hard brush and gum massager and stimulator tip nested in the hollow spaces of the two tubes that form the handle.

Figure 13 shows the toothbrush with the gum massager and stimulator tip rotated about a hinge pin into the extended position and an optional configuration with the interdental hard brush.

Figure 14 shows a cross section of the sliding cover as it captures the gum massager and stimulator tip or the interdental hard brush.

Figure 15 shows the toothbrush plan view with two captured knurled sleeves that threads out and in the interdental hard brush and the gum massager and stimulator tip.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Description - Figures 1 to 4 - FIRST EMBODIMENT OF THIS INVENTION

A typical embodiment of the assemblage of the present invention is illustrated in Figure 1, plan view, with the interdental hard brush and gum massage stimulator tip retracted in tandem, in the two ends of the toothbrush.

This invention provides a means for combining the brushing cleaning function with the gum massage function and the much needed interdental brush function, all in one tool. In order to achieve the triple clean effect of this toothbrush, Figure 1 shows the toothbrush (20) and its handle (21) of the tool containing at one end the bristles (23) of the brush (22), clustered in groups, to provide an efficient pattern to fully brush the teeth externally, in a conventional manner. These said bristles are captured in the end of said toothbrush in an elongated pattern and are firmly molded into the toothbrush body (19), as shown in Figure 2.

Inside this said toothbrush and its handle, as shown in Figure 3, there is a tubular hollow chamber (29) that runs the full length of the handle. In addition, the handle is narrow (24) and slim for a short distance from the brush end up to the area where the user holds the said handle for ease of entering and brushing the teeth in the mouth. At this point where the user holds the tool, the handle is widened out to provide a wider and firmer grip for grasping the tool and contains recessed into this grip area the said hollow chamber (29) that contains a sliding button (26) that is keyed (36) to a slide (34) that slides back and forth on the inside of the said tubular hollow chamber in the tool. Attached to the end of this said slide there is an extension tube (27) that holds the interdental hard brush (28) for brushing in the gaps and spaces between the teeth.

The said sliding button (26) can be moved horizontally in a slot (31) that controls its travel distance, in either direction. Movement in one direction extends the interdental hard brush out of one end of the toothbrush, ready for use. Movement of the said button (26) keyed (36) to a slider (34) that has the said internal sliding tube (27), extending out of one end provides movement that, in the opposite direction, retracts the said interdental hard brush into a pocket (25) in the toothbrush, below the section where the bristles are molded into the tool.

In like manner, Figure 3 shows the opposite end of the toothbrush containing an identical sliding button (26) an extension tube (37), a key (36), and a slide (34) in the long hollow chamber (29) within the handle section of the toothbrush and the movement of the said button extends and retracts the said extension tube that is keyed to the said slide that holds on its end the gum massager and stimulator tip (30). Movement of the button in the said slot (31) in one direction extends the said gum massager and stimulator tip (30), ready for use at the other end of the toothbrush, and movement of the said button (26) in the opposite direction retracts it into the handle. Figure 4 shows both the said gum massager and stimulator tip (30) and the interdental hard brush (28) retracted into the toothbrush. The toothbrush user has now available all three functional tools in one assembly. All three are held firmly in the same tool and readily available for addressing each tooth cleaning function as needed, in any cleaning order, at the user discretion.

The ends of the said internal sliding extension tube (27) and (37) are made to accept at either end of the said toothbrush the said gum massage stimulator tip (30) or the said interdental hard brush (28). This invention could accept other end attachments such as a toothpick, dental floss, or other dentist recommended cleaning or treatment tools, should they be required.

Both the said gum massager and stimulator tip (30) and the said interdental hard brush (28) can be replaced as needed. The respective said sliding extension tubes have replacement capability.

It has been found that if the user applies diligently to all three cleaning, brushing and massaging functions on a regular basis, the life of the three components is about equal, i,e., all three will wear out at about the same time. Therefore, the brush user will replace the inexpensive assembly rather than attempt to replace individual parts. For that reason, no complex latching functions are needed in this triple-clean toothbrush.

For assembly and manufacturing purposes, and should there be a need for replacement of the said rubber tip that constitutes the gum massager and stimulator, or the said interdental hard brush, the said extension tubes (27) or (37) contain a slit (17) down one side, or two sides if needed, to permit the tube to be expanded in diameter and allow insertion of the said gum massager and stimulator tip (30) or said interdental hard brush (28) to be forceably pressed into the said extension tube. In Figure 3A an enlarged view shows how the said slit in the tube side walls capture and hold the stem (18) of the said gum massager and stimulator tip and said interdental hard brush by deflection of the said slit tube side walls. The said stem is slightly reduced in diameter where the said sliding tube side walls grasp the said stem and capture it. The said stem contains minor indentations to impede easy removal from the said slit extension tubes and the inner wall of the said extension tubes is course machined to increase the resistance of component removal.

Description - Figures 5 to 10 - SECOND EMBODIMENT OF THIS INVENTION

This embodiment also provides a means for combining the brushing cleaning function with the gum massage and stimulation functions and the much needed interdental brush function all in one tool but the assemblage places the interdental hard brush and the gum massager and stimulator tip, are both at the opposite end of the toothbrush bristles, as shown in Figure 5.

The toothbrush handle (21) of this tool embodiment contains at one end the toothbrush (22) with the bristles (23) clustered in groups, in a conventional manner. In this embodiment, Figure 7 shows the said handle (21) comprising of two hollow cylinders (32) shown in a sectional view in Figure 6 that run the full length of the handle. In addition, the handle is narrow and slim (24) for a short distance from the brush end, for ease of brushing and entering into the mouth. At the point where the user holds the said handle, it is widened out to provide this wider grip for grasping the tool and the grip is comprised of the said two hollow cylinders (32) running parallel to each other that retain a sliding button (26) that is attached to a slider (34) with a key (36) that runs in a slot (31) and the said key engages the said traveling slider (34) that slides back and forth in each of the said long hollow cylinders that comprise the said handle as illustrated in **Figures 5 - 7 - 8 - 9**. The travel length is defined by said slot (31) in each of the said hollow cylinders and the said key (36) engages both the said button (26) and the said traveling slider (34). Attached to the end of the said slider is an extension tube (37) that holds the interdental hard brush (28) for brushing in the gaps and spaces between the teeth. The said sliding button can be moved a short distance, horizontally in its said slot, in the two said hollow cylinders, in either direction. Movement in one direction extends, ready for use, the said interdental hard brush out of the end of one of the said hollow cylinders, that is part of the said handle of the toothbrush. Movement of the said button attached to the said internal extension tube, in the opposite direction, retracts the said interdental hard brush into the

said tube, that is part of the said toothbrush handle. In like manner, shown in Figure 10, within the second parallel hollow cylinder, but on the opposite side of the said toothbrush handle, the embodiment contains an identical button (26), and sliding tube (37) in the long cavity (29) of the two said hollow cylinders that form the said handle of the toothbrush, and the movement of the said button (26) extends and retracts the said extension tube that has attached to its end the said gum massager and stimulator tip (30). Figure 10 shows the said gum massager and stimulator tip extended and Figure 10A shows it retracted. Movement in one direction extends out the said gum massager and stimulator tip, ready for use, and movement of the said button in the opposite direction retracts it into the said hollow cylinder that is part of said handle of the toothbrush. The said button that moves the said slider can be located as shown in sectional Figure 6 on the center of the said handle or at any position around the perimeter of the said cylinders, as shown in Figures 9 and 10.

The toothbrush user has available all three functional tools in one assembly, all held firmly in the same tool and easily available for addressing each tooth cleaning function as needed, independently, in any cleaning order, at the user discretion.

The ends of the said internal sliding extension tubes are made to accept either the said gum massager and stimulator tip (28), the said interdental hard brush (30) or other dentist recommended cleaning or treatment tools. Both the said gum massager and stimulator tip and the said interdental hard brush can be replaced as needed.The said sliding tube extensions save replacement capabilities,as shown in Figure 3A.Both said cylinders that form the said handle of the toothbrush and contain inside the two said additional tools, have close-out caps (47) hinged to the cylinder ends to seal them and avoid damage and any possible contamination. The said close-out caps can be rotated open as shown in Figure 7 by movement of the said button (26) to the extend position which pushes open the said close-out cap. After the cleaning of the respective tools, following their use, the said caps are rotated back into the end of the said cylinders, to seal them.

Description - Figures 11 to 14 - THIRD EMBODIMENT OF THIS INVENTION

The assemblage of this embodiment shown in Figures 11 - 12 - 13 - 14, places the interdental hard brush (28) and the gum massager and stimulator tip (30) at the opposite end from the conventional bristles of the toothbrush (20) in two recess chambers (49) that run parallel to each other in the handle (21). Within each said recess chamber there is installed a sliding cover (20) for closing out the said recess chamber and a tubular support arm (41) that is Tee-shaped with the cross member (42) providing an axis (33) for the said Tee to rotate around a pivot upward out of the said recess chamber. The said cross member contains two projection pins (43) that work like an axle that locate it in the said recess chamber (49) and each said projection pin engages a hole (39) located on the sidewall of the said recess chamber. With these said projection pins positioned in their said mating hole, the said support can be rotated around the said axis provided by these said projecting pins.

The other end of the said tubular support arm provides an extension tube (37) with the slit sidewalls as previously shown in Figure 3A for insertion of the interdental hard brush (28) or the gum massager and stimulator tip (30). As said tubular support arm is narrow and sits in its said toothbrush handle recess chamber with ample room about it, then the user can easily grasp it with his fingers and rotate it out of the said handle recess chamber. After rotation to the extended work position, the cover (40) can be slid over the pivot point (43) and locks it in the extended location, as shown in Figure 14. The recess chamber that contains these rotating tools can be located on any side of the said handle that is available.

In this embodiment, each said recess chamber (49) in said toothbrush handle is provided with said sliding cover (40) shown in Figure 11, that protects the internal dental tools from damage by handling and contamination. Figure 12 in this embodiment shows the said covers slid back in the open position and the tools are

available in their protective recess chambers (49) . With the said covers in the open position the tools can be rotated out ready for use as shown. In Figure 12 each said cover contains serrated grooves (48) to make it easy to slide the cover open and closed. Figure 13 illustrates how either tool can be rotated to the user position easily and quickly. Figure 14 illustrates a cross section through the said pivot point and shows how the said cover (40) slides in said grooves molded in the side walls of the said recess chamber (49) and captures the said tubular arm cross member (42) in a locked position.

Description - Figure 15 - FOURTH EMBODIMENT OF THIS INVENTION

In this embodiment of the toothbrush (50) two knurled or serrated threaded sleeves (45) are provided to extend or retract the interdental hard brush (28) and the gum massager and stimulator tip (30) out of the handle (51) as illustrated in Figure 15. Each of these said threaded sleeves, when rotated individually threads out an threaded internal shaft (46) that extends the tubular extension with the said interdental hard brush and said gum massager and stimulator tip attached to their ends.

Opposite rotation of each of the said sleeves retracts the said threaded internal shaft and this causes the retraction of said interdental hard brush and said gum massager and stimulator tip into the chamber that forms the handle of the said toothbrush. Close-out caps (47) hinged to the tube ends will close each tube to prevent damage and contamination. These said close-out caps, or covers, operate and are attached to the said toothbrush handle in a similar manner as shown and described in Figure 7 of a previous embodiment. Figure 15 shows structural cross members (48) that capture and support the said threaded sleeves.

The body of said handle is comprised of three chambers, a forward closed chamber (52), a closed aft chamber (53) and a center open chamber (54) that captures the two threaded sleeves and provides access to them by rotating them to screw in and out the said internal threaded shaft with extension tubes (37) that hold the said interdental hard brush and the said gum massager and stimulator tip.

In this manner, the said interdental hard brush and the said gum massager and stimulator tip are attached to said tubular extensions (37) that extend from the end of the said threaded shaft (46). and both interdental hard brush and gum massager and stimulator attach to the said tubular extension in the. manner described in previous embodiments.

This invention is simple in construction, easy to operate, unique in arrangement, function and assembly, and lends itself to economical manufacture. These features of the various embodiments, together with other objects and advantages which become subsequently apparent, reside in the details of the construction and operation, as more fully herein described and claimed, reference being added in the accompanying drawings, forming a part herein.

Although the description above contains many specifications, these should not be construed as limiting the scope of the invention, but as merely providing illustrations of some of the present embodiments of the invention, as well as equivalent embodiments.
